Early Math Fluency CBM Probe: Quantity Discrimination

This introduction to the Quantity Discrimination probe provides information about the preparation, administration, and scoring of this Early Math CBM measure. Additionally, it offers brief guidelines for integrating this assessment into a school-wide 'Response-to-Intervention' model.

Quantity Discrimination: Description (Clarke & Shinn, 2004; Gersten, Jordan & Flojo, 2005)
The student is given a sheet containing pairs of numbers. In each number pair, one number is larger than the other. The numbers in each pair are selected from within a predefined range (e.g., no lower than 0 and no higher than 20). During a one-minute timed assessment, the student identifies the larger number in each pair, completing as many items as possible while the examiner records any Quantity Discrimination errors.

Quantity Discrimination: Preparation
The following materials are needed to administer Quantity Discrimination (QD) Early Math CBM probes:

- **Student and examiner copies of the QD assessment probe. For each probe, 2 student pages and one examiner page are available to print. The student pages may be put into clear page protectors (back to back) in order to be used with multiple students. The teacher should clearly write the student's name and the date of the assessment on each examiner copy (1 per student).**
- A pencil, pen, or marker
- A stopwatch

Quantity Discrimination: Directions for Administration

1. The examiner sits with the student in a quiet area without distractions. The examiner sits at a table across from the student.

2. The examiner says to the student:

   "The sheet on your desk has pairs of numbers. In each set, one number is bigger than the other."

   "When I say, 'start,' tell me the name of the number that is larger in each pair. Start at the top of this page and work across the page [demonstrate by pointing]. *Try to figure out the larger number for each example.. When you come to the end of a row, go to the next row. Are there any questions?* [Pause] *Start.* "

   NOTE: If the student has difficulties with speech production, the examiner can use this alternate wording for directions: *"When I say, 'start,' point to the number that is larger in each pair"*

3. The examiner begins the stopwatch when the student responds aloud to the first item. If the student hesitates on a number for 3 seconds or longer on a Quantity Discrimination item, the examiner says, *"Go to the next one."* (If necessary, the examiner points to the next number as

a student prompt.)

4. The examiner marks each Quantity Discrimination error by marking a slash (/) through the incorrect response item on the examiner form.

5. At the end of one minute, the examiner says, *"Stop"* and writes in a right-bracket symbol ( ]) on the examiner form after the last item that the student had attempted when the time expired. The examiner then collects the student Quantity Discrimination sheet.

Quantity Discrimination: Scoring Guidelines

Correct QD responses include:

- Quantity Discriminations read correctly
- Quantity Discriminations read incorrectly but corrected by the student within 3 seconds

Incorrect QD responses include:

- The student's reading the smaller number in the QD number pair
- Correct QD responses given after hesitations of 3 seconds or longer
- The student's calling out a number other than appears in the QD number pair
- Response items skipped by the student

To calculate a Quantity Discrimination fluency score, the examiner:

1. counts up all QD items that the student attempted to answer and
2. subtracts the number of QD errors from the total number attempted.
3. The resulting figure is the number of correct Quantity Discrimination items completed.(QD fluency score).

Adjusted Score:

If a child stops, (or finishes the probe), before the minute is up; **note the number of seconds the child worked.**
Then use the formula below to "adjust" the child's score:

$\frac{\text{\# correct}}{\text{\# seconds}} = A$

A x 60 = # answers correct per minute (adjusted test)

For example:

Suzy got 5 correct and stopped after 30 seconds.

5 ÷ 30 = .16

.16 x 60 = 9.996 which rounds to 10

So Suzy got 10 correct numbers per minute.

We can now graph the **numbers per minute score.**

Use the Excel Graphing Program to keep track of student data for progress monitoring.